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| APPLICATION NO. | FILING DATE | FIRST NAMED INVENTOR | ATTORNEY DOCKET NO. | CONFIRMATION NO. |
|-----------------|-------------|----------------------|---------------------|------------------|
| 09/995,678 | 11/29/2001 | Takashi Hosoya | Q67410 | 1021 |

7590 08/01/2003

SUGHRUE, MION, ZINN, MACPEAK & SEAS
2100 Pennsylvania Avenue, N.W.
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EXAMINER

THOMPSON, KENNETH L

| ART UNIT | PAPER NUMBER |
|----------|--------------|
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3679

DATE MAILED: 08/01/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/995,678

Applicant(s)

HOSOYA ET AL.

Examiner

Kenn Thompson

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 13 May 2003.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-16 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-13 is/are rejected.
- 7) ☒ Claim(s) 14-16 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on _____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____
- 4) ☐ Interview Summary (PTO-413) Paper No(s). _____
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other:

DETAILED ACTION

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

Claims 1-4, 6, 12 and 13 are rejected under 35 U.S.C. 102(e) as being anticipated by Ouchi et al., U.S. 6,299,542.

Regarding claims 1-4, Ouchi et al. discloses in figures 1-6 a constant velocity joint for use with a propeller shaft (not shown at 145). Ouchi et al. discloses an outer race (141) having a spherical inner surface with a plurality of track grooves (108) defined therein. Ouchi et al. discloses each track groove having a groove bottom of longitudinal sectional shape representing a curve. Ouchi et al. discloses an inner race (102) having a spherical outer surface having a plurality of track grooves (107) defined therein in correspondence with the respective track grooves in the outer race. Ouchi et al. discloses the track groove in the inner race having a groove bottom of a longitudinal sectional shape of a curve. Ouchi et al. discloses a plurality of balls (104) interposed between the outer and inner races and rotatably accommodated between the mating track grooves in the outer and inner races. Ouchi et al. discloses a retainer (109b) having a plurality of pockets accommodating the balls. Ouchi et al. discloses the retainer having a spherical outer surface held in surface contact with the spherical inner surface of the outer race and a spherical inner surface held in surface contact with the spherical outer surface of the

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inner race (fig 6). Ouchi et al. discloses the track grooves in the outer race having a center of curvature (Oe) lying in an axial section of the outer race. Ouchi et al. discloses the track grooves in the inner race having an center of curvature lying on an axial section of the inner race (Oi). Ouchi et al. discloses the center of curvature of each track groove in the outer race and the center of curvature of the track groove in the inner race being offset an equal distance (h) fore and aft the angle center of the joint. Ouchi et al. discloses use of post hardening cut surfaces (col. 18, line 64 - 67) on the spherical inner surface of the outer race, spherical outer surface of the inner race and the inner surface of the of the pockets (110a). Applicant should note that the method of forming the device is not germane to the issue of patentability of the device itself. Therefore, this limitation has not been given patentable weight.

As to claim 6, Ouchi et al. discloses in figure 13 eight track grooves (1b, 2b) in the inner and outer races.

As to claim 12, Ouchi et al. discloses in figure 19 track grooves in the outer race having an oval transverse sectional shape.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claim 5 is rejected under 35 U.S.C. 103(a) as being unpatentable over Ouchi et al. et al., U.S. 6,299,542 in view of Krude, U.S. 4,529,254

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As to claim 5, Ouchi et al. discloses in figure 5 the outer race (1) having an inlet mouth (133) and a rear opening (opening at 108) opposite the inlet mouth. Ouchi et al. discloses the outer race having a fitting flange (117) formed therewith at a location radially outwardly of an outer periphery of the inlet mouth and a cylindrical mount (axial extension of 133, 131) formed so as to protrude axially outwardly from the opening. Ouchi et al. discloses a propeller shaft (not shown at 145) extends through the rear opening and is engaged with the inner peripheral surface (101c) of the inner race. Ouchi et al. does not disclose the rear opening having a diameter smaller than the diameter of the inlet mouth. Krude teaches in figure 1 use of rear opening (opening of 2 at 11) having a diameter smaller than the diameter of the inlet mouth (20) to allow for the removal of the propeller shaft through the inlet mouth of the wheel assembly. It would have been obvious to one having ordinary skill in the art at the time of the invention to modify the inlet mouth and rear opening disclosed by Ouchi et al. to have the diameter of the inlet mouth to be larger than the rear opening to allow for the removal of the propeller shaft through the inlet mouth of the wheel assembly to enable quick replacement of the inner joint member and shaft.

Claims 7-9 are rejected under 35 U.S.C. 103(a) as being unpatentable over Ouchi et al. et al., U.S. 6,332,844 in view of Yamamoto et al., U.S. 6,367,981

As to claims 7-9, Ouchi et al. et al. discloses the retainer (109b). Ouchi et al. et al. does not disclose the surface of the retainer has a surface treatment layer of solid lubricant that is a low temperature sulfurized layer. Yamamoto et al. teaches in figure 1 use of a retainer (4) having a surface treatment layer of solid lubricant that is a low temperature sulfurized layer (col. 2, lines 2-21; molybdenum disulfide) to enhance performance in areas of elevated temperature, vacuum, special atmosphere, extreme low temperature and irradiation environments. It would

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have been obvious to one having ordinary skill in the art at the time of the invention to modify the surface of the retainer disclosed by Ouchi et al. to have a surface treatment layer of solid lubricant that is a low temperature sulfurized layer; as taught Yamamoto et al. to enhance performance in areas of elevated temperature, vacuum, special atmosphere, extreme low temperature and irradiation environments. It is well known that a rolling bearing is liable to scatter lubricant or grease the can enter the external atmosphere, therefore in cases where a pure atmosphere is required no lubricants or grease can be used. Applicant should note that the method of applying the sulfurized layer is not germane to the issue of patentability of the layer itself. Therefore, this limitation has not been given patentable weight.

Claims 10-11 are rejected under 35 U.S.C. 103(a) as being unpatentable over Ouchi et al. et al., U.S. 6,332,844 in view of Jacob et al., U.S. 5,580,313.

As to claim 10, Ouchi et al. discloses the track grooves (108,107) of the inner and outer races. Ouchi et al. does not disclose the corresponding ball cooperate to define radial gaps there between of less than 0.05 mm. Jacob et al. teaches use of the ball to cooperate with the inner and outer races to define radial gaps there between of less than 0.05 mm (col. 4, lines 56-67) to provide the functional play that is required for the functioning of the joint. It would have been obvious to one having ordinary skill in the art at the time of the invention to modify the ball discloses by Ouchi et al. to cooperate with the inner and outer races to define a gap there between of less than 0.05 mm as taught by Jacob et al. to provide the functional play that is required for the functioning of the joint. Moreover the optimization of proportions in a prior art device is a design consideration within the skill of the art. In re Reese, 290 F.2d 839, 129 USPQ 402 (CCPA 1961).

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As to claim 11, Jacob et al teaches in figure 1 the pockets (10) in the retainer (11) and the corresponding ball (9) cooperate to define positive axial gaps (col. 5, lines 14-22).

Claim 13 is rejected under 35 U.S.C. 103(a) as being unpatentable over Ouchi et al. et al., U.S. 6,332,844.

As to claim 13, Ouchi et al. discloses a spherical inner surface of the outer race. Ouchi et al. is silent as to whether the surface has a roughness of 0.8 or less, as stipulated in B0601 of the JIS standards. However it would have been obvious to one having ordinary skill in the art at the time of the invention to adhere to standard practice.

Allowable Subject Matter

Claims 14-16 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

The prior art of record does not disclose or suggest all the claimed subject matter including an undercoat of manganese phosphate between the surface of the retainer and the solid lubricant.

The prior art does not disclose the surface treatment layer formed on the inner and outer races is different than the surface treatment layer formed in the surface of the retainer.

Response to Arguments

Applicant's arguments with respect to claim 1-12 have been considered but are moot in view of the new ground(s) of rejection.

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Conclusion

The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

Sugiyama et al., U.S. 5,692,960 discloses a similar interference fit.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Kenn Thompson whose telephone number is 703 306-5760. The examiner can normally be reached on 7:00 am - 4:30 pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Lynne H Browne can be reached on 703 308-1159. The fax phone numbers for the organization where this application or proceeding is assigned are 703 305-7687 for regular communications and 703 305-7687 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 703 308-2168.

KT

July 25, 2003


Lynne H. Browne
Supervisory Patent Examiner
Group 3600